# “Effectiveness of Dry Needling with Stability Exercises versus Manual Pressure Release with Stability Exercises for Non-Specific Low Back Pain – A Comparative study”

A project submitted in partial fulfilment

of the requirements for the degree of

**MASTER OF PHYSIOTHERAPY**

Submitted by

**Register number: 271710204**

Under the guidance

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Submitted to

**THE TAMILNADU DR M.G.R MEDICAL UNIVERSITY**

**CHENNAI-32**

**P.P.G COLLEHE OF PHYSIOTHERAPY**

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**INTERNAL EXAMINAR:**

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## CERTIFICATE I

This is to certify that the dissertation entitled **"Effectiveness of Dry Needling with Stability Exercises versus Manual Pressure Release with Stability Exercises for Non-Specific Low Back Pain – A Comparative study**" was carried out by **Register no: 271710204, P.P.G College of physiotherapy,**Coimbatore-35,affliatedto the **Tamil Nadu DR.M.G.R Medical University,**Chennai-32.**This study was done under my guidance and direct supervision.**

**PROF. DR.C.SIVA KUMAR, M.P.T (ORTHO), MIAP,PHD.,**

**PRINCIPAL AND GUIDE**

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# ABSTRACT

## BACKGROUND OF THE STUDY:

Low Back Pain (LBP) is a common and disabling disorder among adults in India. Nonspecific back pain, with or without radiation is by poor posture or long term abnormal physiological loads. Physical deconditioning, Lack of exercise, and frequent abnormal loading result in the formation of trigger points in the musculature causing musculoskeletal imbalance.

The Management of LBP including Surgery, Drug therapy and non-medical interventions. Clinicians have been seeking for beneficial non-drug therapies including acupuncture, exercise, and multidisciplinary and behavioural treatment.

The objective of the present study is to determine the effectivenessof dry needling with stability exercises versus manual pressure release with stability exercises for chronic Non-specific low back pain.

## METHODOLOGY:

In this experimental study 20 patients with Non-Specific LBP were randomly divided into two Group (A&B). Group A was given Dry Needling with Stability Exercises, and the other Group B was given Manual Pressure Release with Stability Exercises.

Visual Analogue Scale (VAS), Oswestry Low Back Pain Disability Index ODI), Modified Schober Index (MSI)were taken to compare before and after treatment regime of 4 weeks.The baseline measurement was compared to the Data.

## RESULTS:

Both the Groups had decrease of pain in VAS score and improved functional ability in ODI, and improved Lumbar flexibility in MODIFIED SCOHBER INDEX. But the Group A felt significant pain release after4 weeks and better functional improvements than Group B.

## CONCLUSION:

This study found that the reduction of pain, lumbar flexibility and functional improvement were seen in both the Groups.
But Dry Needling with Stability Exercises in Group A has shown more significant effect than Manual Trigger Release with Stability Exercises in Group B.


## KEYWORDS:

Low Back Pain, Dry Needling, Manual Pressure Release, Stability Exercises, Visual Analogue Scale,Oswestry Disability Index,Modified Schober Index.

# INTRODUCTION

# CHAPTER I
# INTRODUCTION

## 1.1 BACKROUND OF THE STUDY:

Chronic Low Back Pain has been a major public health challenge in worldwide,contributing great medical burden and job related disability affecting job performance.About 60-80 per cent of adults experience LBP at some point in their life.

Nonspecific back pain, with or without radiation is by poor posture or long term abnormal physiological loads.Cornwall et al stated that spasm in the Multifidus muscle can cause local and reflected pain. Currently clinicians have been focusing on Manual Therapy techniques to treat the muscular dysfunctions related to spasm andMyofascial Trigger Points (MTrPs).

Dry Needling(DN) as a relatively new treatment modality developed byDr Chan Gunn is often used to treat musculoskeletal pain frequently chronic pain.The DN technique applied to Trigger Points(TrPs),reduces the number and sensitivity of TrPs related to pain and mechanical disruption of TrPs.

Trigger pointsare defined as hyperirritable points in a taut band of skeletal muscles that create pain and cause reflected pain when they are palpated.TrPs are clinically classified as active and latent.Active TrPs are spontaneously painful and they cause reflected pain that produces symptoms when they are palpated.Latent TrPs do not create spontaneous pain but they are a source of reflected pain.

Manual Pressure Release Technique(MPR)known as sustained manual pressure, ischemic compression,inhibition and trigger point release,is the one of the manual therapy technique utilized for the treatment of TrPs. It works through the principle ofSlow Sustained Stretch that produces lengthening in muscle fibresresults in ease of tightness and relief of pain.

According to a recent study instability of the lumbar spine is the most important causes of chronic back pain.Stability exercises have become a popular form of therapeutic exercises to restore proper kinetic function and beneficial in sub-acute and chronic stages of LBP.

Core stabilization exercises result in improved function and reduced pain in CNSLBP. Neural adaptation from core training include more efficient neural recruitment patterns, faster nervous system activation, improved synchronization of motor units and a lowering of neural inhibitory reflexes.

In their systematic review, Wang et all found that core exercises produced better outcomes than general exercises during the initial 3 months of intervention in LBP.

Yet the significance was absent using stability exercises with DN and MPR and this study aimed at comparing the clinical efficacies of both Manual Therapy Techniques with stability exercises to determine the most beneficial result oriented therapeutic approach to treat Low Back Pain.

## 1.2 NEED OF THE STUDY

Myofascial Trigger Points are one of the common causes for back pain resulting in musculoskeletal imbalance and poor kinetic chain.

This study utilizes the two effective treatments for Myofascial trigger points namely Dry Needling and Manual Pressure Release with Stability Exercises to determine the effective treatment for Myofascial trigger release and Chronic Non-Specific Low Back Pain.

## 1.3 AIMS OF THESTUDY:

To know the significance of Dry Needling with stability exercises and Manual Pressure Release Techniques with stability exercises and compare the effectiveness of both treatments in treating Low Back Pain.

## 1.4 OBJECTIVESOF THE STUDY

- To determine the efficacy of Dry Needling with stability exercises.
- To determine the efficacy of Manual Pressure release with stability exercises
- To compare the effectiveness of Dry Needling with stability exercises and Manual Pressure Release with Stability Exercises Techniques.

## 1.5 HYPOTHESIS

## NULL HYPOTHESIS

There will not be significant reduction in pain and functional improvement with Dry Needling with Stability Exercises versus Manual Pressure Release with Stability Exercises in cases with Low Back Pain.

## ALTERNATIVE HYPOTHESIS

There will be significant reduction in pain and functional improvement with Dry Needling with Stability Exercises and Manual Pressure Release with Stability Exercises in cases with Chronic Non-Specific Low Back Pain.

## 1.6 OPERATIONAL DEFINITION

## CHRONIC LOW BACK PAIN

Chronic back pain is defined as pain that lasts for more than three months. It is often progressive and the cause can be difficult to determine.

**MINNESOTA COMMUNITY MEASUREMENT -2010**

## NON - SPECIFIC LOW BACK PAIN (NSLBP):

NSLBP is described as a diagnosis of exclusion where pain caused by a suspected or confirmed serious pathology or presenting as a radicular syndrome has been ruledout.
The Diagnosis is dependent on the Clinician satisfaction of having not Specific Causes.

**REVIEW ON NATIONAL GUIDELINES.2017**

## DRY NEEDLING (DN).

US-based,National physical therapy associationand several state boards of physical therapy have defined Dry Needling as an intramuscular procedure. i.e. The insertion of needles into noduleswithin taut bands of muscle,more commonly referred to as Trigger Points or Myofascial Trigger Points. More specifically, these professional organizations have equated the procedure of dry needling with the term “intra muscular manual therapy”(IMT)or “trigger point Dry Needling”(TDN).

IMT and TDN are individual aspects of Dry Needling. Each describes a single framework, paradigm, or approach that falls under the much larger field of Dry Needling.

**JAMES DUNNING :Physical Therapy reviews 2014.**

## MANUAL PRESSURE RELEASE (MPR).

Simons et al defined Ischemic compression as Trigger points pressure release and described as application of slowly increasing, non- painful pressure over Trigger points until a barrier of tissue resistance is encountered. Contact is maintained until the tissue barrier releases and pressure is increased to reach a new barrier to eliminate the trigger point tension and tenderness.

**DIMITRIOS KOSTOPOULOS 2008**.

## STABILITY EXERCISES

Panjabi suggested that core stability is the integration of passive spinal column, active spinal muscles and the neural control unit which when combined maintaining the intervertebral range of motion with in a safe limit to enable activities to be carried out during daily living.

**HIBBS et al, 2008**.

TransversusAbdominis,LumbarMultifidus, andother Paraspinal,Abdominal, Diaphragmatic, Gluteal muscles and Pelvic floor are targeted in core stabilization exercises.

**MUHAMMAD WASEEM AKHTAR : Pak J Med Sci 2017**.

## OSWESTRY DISABILITYINDEX(ODI)

ODI was used to measure functional disability level. This self-administered questionnaire consists of 10 Items; each having a score of 0 to 5.ODI total scores ranges from 0 to 50.

**YAKUT et al.2004**

## VISUAL ANALOGUE SCALE(VAS)

Intensity of pain was evaluated with VAS which is reliable and valid measure of pain intensity and it is sensitive to clinical changes in pain .A zero at left end of scale indicates no pain while 10 indicates a worst imaginable pain.

**EMINE HTet al.2017**

## MODIFIED SCHOBER INDEX (MSI):

Lumbar Mobilitywas assessed in using MSI. Patient is standing with his back towards the examiner. The examiner determines the location of the lumbosacral junction by locating the dimples of Venus. The intersection of the top of the dimples of Venus is marked by drawing a horizontal line. This line acts as the landmark. The second line is marked 10 cm above the first line and the third is marked 5 cm below the first line. The difference between the measurements in erect and flexion indicated the mobility of lumbar spine. The validity of this method was proved against radiograph.

**TOUSIGNANT et al,2005**

# REVIEW OF LITERATURE

# CHAPTER II

# REVIEW OF LITERATURE

## 2.1 REVIEW RELATED TO PREVALANCE OF LOW BACKPAIN(NON SPECIFIC LOW BACK PAIN)

### ANNA CITKO et al (2018)

He conducted a study in the Department of Family Medicine at Medical University of Bialystok,Poland on prevalence and recurrence of NSLBP and Chronic NSLBP among medical personnel involving 609 patients with30-60 years age.The results of their study indicate that with each year length of employment the frequency of recurrent non-specific back pain decreases significantly, while the frequency of CNSLBP increases significantly. Sedentary lifestyle,such as excessive consumption of coffee increases the risk of NSLBP recurrence 16 times. Predictive factors for disability associated with NSLBP are overweight and obesity. In conclusion over 40% of recurring NSLBP is an important health concern in Nursing and Paramedical professions.

### SUDHIR GANESAN et al (2017).

A total of 1,532 young adults with age 18to 35 were enrolled in this Cross-Sectional Study. It was conducted among coaching Institutesof IndianAdministrative Service Aspirants and Medical Post Graduate AspirantsinDelhi.1,355 were completed the Questionnaire. The study conclusion is that Indian population revealed that Indian youthprone to develop LBP;this aligns with published western Literature. The study also identified various modifiable and non-modifiable risk factors for LBP in young Adultsidentification of these risk factors at an early stagewill prevent the progression of acute LBP to chronic LBP.

## HAQ SA et al (2005)

He carried out this survey in a Rural Community, an Urban Slum, and an Affluent Urban Community with samples of 2635,1317,1259 Adults respectively. He did this study in Department of Medicine at Bangabandhu Sheikh Mujib Medical University Shahbagh, Indonesia. Through door- to- door survey with trained interviewers, identified subjects with musculoskeletal pain. Community Oriented Program for Control of Rheumatic Disorders Questionnaire, adapted and validated Bengali version was used as outcome measure. The prevalence of NSLBP were 6.6% in rural,9.9% in urban slum,9.2% in urban affluent community

## 2.2 REVIEW RELATED TO TREATMENT TECHNIQUES

## DRY NEEDLING TECHNIQUE

## LIU L,et al(2018)

He conducted this study in the Department of Sport Medicine and the Centre of Rehabilitation at Shanghai University of Sport, China;To evaluate the current evidence of the effectiveness of dry needling in the management of LBP .A total of 11 Randomized Controlled Trials involving 802 patients involved in the Meta- Analysis.The conclusion of the study is that moderate evidence showed that dry needling especially if associated with other therapies,could be recommended to relieve the intensity of LBP. However the clinical superiority of DN in improving functional disability and follow-up effects still remains unclear.

## CASTRO SANCHEZ AM,et al(2018)

He did this study in a Department of Nursing, Physical therapy and Medicine, at University of Almeria,Spain. This single- blind Randomized Controlled Trial was conducted in 64 subjects with fibromyalgia to compare the effect of Dry Needling with Myofascial Release.The conclusion is that DN showed higher improvement than Myofascial Release for pain pressure thresholds, body pain vitality and social function,general pain intensity, quality of sleep, fatigue, anxiety,depression and fibromyalgia symptoms.

## EMINE HANDAN TUZUN et al(2017)

This single-blind, Randomized Controlled Trial was carried out at the Eastern Mediterranean University Faculty of Health Sciences Department of Physiotherapy and Rehabilitation.34 patients with age 35 to 70 with Chronic LBP were included in the study. The conclusion of the study is that DN technique is useful in the management of LBP with disc herniation.

## CEREZO-TELLEZ E et al (2016)

He conducted this study at a Public Primary Health Care Centre Madrid,Spain.130 participants with Nonspecific Neck pain with active MTrPs in cervical muscle were included in this study. The conclusion is that dry needling with passive stretching is more effective than passive stretching alone and results support the use of dry needling in the management of Non- specific Neck pain.

## MANUAL PRESSURE RELEASE TECHNIQUE

## RICHA K et al (2018)

He did this study in the Department of Physiotherapy Prakash Institute of Physiotherapy and Rehabilitation UP,India. The aim of the study is to compare the clinical efficacy of Manual Pressure Release(MPR) and Muscle Energy Technique(MET) in 45 female participants with neck pain with age 18 to 30.the conclusion of the study is that MPR and MET are equally effective in reducing painmuscle tenderness and improving neck disability.

## CHAO YW et al(2016)

He conducted this study in 31 subjects in School and Graduate Institute of Physical Therapy, College of Medicine, National Taiwan University, Taiwan. He did a Randomized Control Trial to investigate the effect of Manual Pressure Release (MPR) alone and in combination with Kinesio taping in MTrPs. The conclusion of the study is that MPR and MPR with Kinesio taping are effective in reducing pain in these subjects.

## CORE STABILITY EXERCISES.

## BRIAN JCOULOMBE et al (2017)

He did this study in kinesiology department, at Texas Lutheran University, Seguin, as data base Randomized Controlled Trials comparing Core Stability Exercises with General Exercises in Chronic Low Back Pain. Participants were male and female adults with Non - Specific Chronic LBP, studies involving 414 Patients were included. The conclusion of the study is that in the short term, Core stability exercises was more effective than general exercises in reducing pain and improving back-specific functional status with LBP.

## MUHAMMAD WASEEM AKHTAR et al (2017)

This is Single Blinded Randomized Controlled trial that was conducted at the department of Physical Therapy Orthopaedic and Spine Institute, Lahore,in which 120 subjectswith chronic nonspecific LBPwith the age 20to 60 were participated.The conclusion of the study is that core stabilization exercise is more effective than routine physical therapy exercises in terms of greater reduction in pain in patients with Non-Specific Low Back Pain.

## 2.3 REVIEW RELATED TO OUTCOME MEASURES

## OSWESTRY DISABILITY INDEX (ODI).

## GABEL CP,et al.(2017)

He did this study in Coolum physiotherapy sunshine coast, Queensland, Australia. Sample size of 35,263, age 15-99 were included to analyse the factor structure of the ODI in a large symptomatic LBP population using exploratory and confirmatory factor analysis. The conclusion is that ODI demonstrated a one factor structure in large LBP sample, two-factor model was not found appropriate for constructs of dynamic and static activity moreover the use of single summary score for ODI psychometrically supported but practical limitation reported in clinical and research settings.

## CHIAROTTO A et al(2016)

He conducted this study in the Department of Health Science at EMGO Institute for Health and Care Research, VU University, Netherlands.The purposeof this study was to evaluate whether the Roland-Morris Disability Questionnaire or the Oswestry Disability Index has better measurement properties than the otherto measure physical functioning in adult patients with NSLBP.A Meta-analysis was conducted using 9 articles, a total of 11 studies, assessing 5 measurements properties.The conclusion was that there are no strong reasonsto prefer 1 of these two instrumentsto measure physical functioning in patients with NSLBP.

## VINCENT JI et al (2014)

He did this study in university of western Ontario, at Department of Health and Rehabilitation Sciences,London. Thirty Subjects were included with a mean age of 42.7 years (22-69)with low back pain to assess the psychometric properties of the ODI-Tamil version. The conclusion of the study is that ODI-Tamil version is a valid and reliable tool to measure patient disability in Tamil speaking with LBP.

## FROST H,et al(2008)

He conducted this study in Health Science Research Institute, at Warwick Medical School,UK. The aim of this study was to compare the responsiveness of a Patient Specific Outcome Measure(PSAQ) with the Oswestry Disability Index(ODI) and the Roland Morris Disability Questionnaire (RMDQ)for patients with mild to moderate sub-acute and chronic low back pain.201 patients were assessed and the conclusion was that the ODI was more responsive than the PSAQ or the RMDQ.

# METHODOLOGY

# CHAPTER III

# MATERIALS AND METHODOLOGY

## 3.1 STUDY DESIGN

This study was a comparative study.

## 3.2 STUDY POPULATION

Subjects with Non-specific Low Back Pain were participated in this study.

## 3.3 SAMPLING SIZE

The sampling size was 20 patients

## 3.4 SAMPLING TECHNIQUE

2o Subjects were randomly divide in to 2 Groups.

## 3.5 STUDY SETTING

The study is conducted at ASHWIN MULTISPECIALITY HOSPITAL, GANDHIPURAM.COIMBATORE.

## 3.6 STUDY DURATION

The study duration was 4 WEEKS

## 3.7 SELETION CRITERIA

### Inclusion criteria

- ✓ Subjects with history of back pain more than 3 months without any specific pathology and causes.
- ✓ Subjects with Myofascial trigger points and its symptoms.
- ✓ Subjects with poor posture with the low back ache resulted from work related causes
- ✓ Lumbar Disc Herniation.
- ✓ Subjects who couldnot sit for long in same position or who change their sitting position frequently.

## Exclusion criteria

- ✓ Acute LBP
- ✓ History of pelvic,spine,surgery,
- ✓ Acute inflammatory conditions,
- ✓ Frequent neurological deficits,
- ✓ LumbarSpondylolesthesis, spinal stenosis,spinal tuberculosis,spinal fracture,
- ✓ Oncological problems and Pregnancy

## 3.8 PARAMETERS

- ❖ Visual Analogue Scale
- ❖ Oswestry Disability Index
- ❖ Modified Schober Method

## 3.9 MATERIALS

- ✓ Treatment table,
- ✓ VAS scoring sheet,
- ✓ Inch tap,
- ✓ Oswestry Disability Index scoring sheet ,
- ✓ DN needle(acupuncture needle),
- ✓ DN Needle disposing box,
- ✓ Alcohol pad,
- ✓ Cold/hot pack
- ✓ Skin moisturizer,
- ✓ Couch,
- ✓ Pillow,
- ✓ Recording Materials (pen,assessment sheet).

## 3.10 PROCEDURE

The subjects referred to PPG College of Physiotherapy, Outpatient Department were considered for study. Informed consent was taken from the Participants and they were grouped into two groups i.e. Group A and Group B. Subjects were assessed for baselines data's of VAS and ODI.

## 3.11TREATMENT TECHNIQUES

## GROUP A: DRY NEEDLING WITH STABILITY EXERCISES

Patients were assessed for needle phobia, hypertension or under any other medication like anti-depression drugetc .

Patients were examined for MTrPs using pinch and flat palpation bilaterally as a taut band either as active TrPs or latent TrPs.

**MUSCLE SELECTION**:

These musculature were selected based on different reasons.

- Multifidus –fundamental segmental stabilizer,
- QuadratusLumboram-spinal stabilizer,
- Erector Spinae, Hamstrings, Gluteal Medias,Gastrocnemius-active TPs frequently seen in these muscles.

### Patients position for needling Technique:

- Gluteal Medias–prone lying position and vertical needling at '90' degree
- Quadratuslumboram,Erector Spinae,Multifidus,Hamstrings and Gastrocnemiusmusculature-prone lying, Oblique Needling at' 45' degree

## Trigger Pointssensitivity

- TrPs sensitivity in the stated muscles were determined by perpendicular thumb pressure on TPS sensitivity levels were recorded using a ranking from 0 to2.
- 0-Indicates thumb palpation increased sensitivity in TPs area without pain indicates intensity of pain increased and patient reports pain when asked.
- 1- Indicates that pain intensity increased and Patient spontaneously notes the pain when pressure is applied.
- 2 -The TPs sensitivity on each muscle were summed and the total recorded as TrPs sensitivity.

Each active MTrPs was diagnosed based on Simons diagnostic criteria- after palpating TrP ,It was marked with pen.Then wiped with alcohol pad.

32 Gauge needle with its plastic guide tube in place was placed over aMTrPs. A tapping motion was used to advance the Needle. Needle movement was performed to elicit twitch response.Needle were kept in place for 5 mints at the 2 mints the needle was rolled to enable re-stimulation or still the trigger releases.

Once needle was removed from a MTrPs,the area was disinfected with a alcohol pad,and asked or observed for side effects such as soreness,local haemorrhages, etc.

## Treatment regime:

- Two muscles bilaterally treated per session with DN Technique. Followed by Stability Exercises with 5-10 Mints rest interval
- 20 mints of DN followed by 30 mints of stability exercises per session. Three sessions per week on alternate days for 4 weeks.
- 10 Sec hold, 8Rep per set,3 Sets per session with 2-3 Mints rest interval between the exercises.

## STABILITY EXERCISES.

Exercises were performed with Abdominal and Pelvic floor Muscles drawing in manoeuvre; maintaining neutral spine with abdominal and pelvic floor muscle activation.

Following exercises were performed in 1st &2nd weeks

- Table top position
- Bridging
- Four point kneeling with single arm or single leg lift
- Bent leg side lift
- side leg lift

**Third week** exercises program

- Dead bug,
- Bridging with single leg raise
- Four point kneeling with side leg lift
- Super- man position,

**Fourth week**exercises program

- Dead bug,
- Super- man position,
- Side Plank,
- Plank

PHOTOGRAPHIC REPRESENTATION

**FIGURE: NO: 1 Table-top position exercise**

**FIGURE :3: Four point kneeling with single leg side lift exercise**

**FIGURE:3:Manual pressure release Techniques**

## GROUP B:MANUAL TRIGGER RELEASE WITH CORE STABILITY EXERCISES

For MPR technique the participants were instructed to be relaxed in lying position prior to the application of pressure.

Muscles selection, Subjects positioning,palpation techniques,treatment regime and exercise regime as per dry needling were applied.

Gradually increasing pressure with the thumb or finger tips applied to the MTrP until the participants reported moderate but tolerable pain with a value of 7 out of 10 on the VAS and that pressure was sustained until the participants reported that the pain decreased to 3 or 4 on the VAS,or reduction in the tissue barrier is felt.

# DATA ANALYSIS AND RESULT

# CHAPTER IV

# DATA ANALYSIS AND RESULTS

## 4.1 STATISTICAL TOOLS

Statistical analysis is done by using Dependent sample(paired)"t" test and Independent sample(unpaired) "t" test

### DEPENDENT SAMPLE "t"test:

$$t = \frac{\bar{d}}{S_d / \sqrt{n}}$$

Symbols used for the *t*-Test

| Symbol | Description |
|---|---|
| $\bar{d}$ | The mean of the differences between the paired data entries in the dependent samples $\bar{d} = \frac{\Sigma d}{n}$ |
| $s_d$ | The standard deviation of the differences between the paired data entries in the dependent samples $s_d = \sqrt{\frac{\Sigma(d-\bar{d})^2}{n-1}} = \sqrt{\frac{\Sigma d^2 - \frac{(\Sigma d)^2}{n}}{n-1}}$ |

**INDEPENDENT SAMPLE "t" test:**

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_p^2}{n_1} + \frac{s_p^2}{n_2}}}$$

$$t - value = \frac{mean1 - mean2}{sp * \sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

where,

$$sp = \sqrt{\frac{(n1 - 1) * var1^2 + (n2 - 1) * var2^2}{n1 + n2 - 2}}$$

and, ***Degrees of freedom = (n1 + n2 – 2)***

n 1 = number of subjects in group A

n2=number of subjects in group B

## 4.2 ANALYSIS OF DESCRIPTIVE DATA

The descriptive data namely pre and post treatment scores using ODI and pre and post VAS scores in Group A and Group B was analysed using dependent sample" t" test and independent sample "t" test .

## 4.3 DEPENDENT SAMPLE" t'' TEST:

Comparison of Group 'A'& 'B' pre and post treatment values of ODI scores

**TABLE I**

| S.NO | VALUES | GROUP A | GROUP B |
|---|---|---|---|
| 1 | Sum of case wise differences | 123 | 74 |
| 2 | Sum of square case wise differences | 1,811 | 636 |
| 3 | Mean of case wise Differences | 12.3 | 7.4 |
| 4 | Standard deviation | 5.75 | 3.13 |
| 5 | Standard deviation error mean | 1.818 | 0.989 |
| 6 | Number of patients | 10 | 10 |
| 7 | Degrees of freedom | 9 | 9 |
| 8 | t value | 6.76 | 7.48 |

In this Alpha is 0.05, Degrees of freedom is 9, Critical value +2.26 to -2.26,"t" value in group A&B is greater than 2.26. If the't' value is lesser than -2,26 or greater than 2.26 the hypothesis is rejected .So the hypothesis is rejected and the test results show that there is significant improvement with both treatments and it is effective in CNSLBP.

## 4.4 INDEPENDENT SAMPLE" t'' TEST:

Comparison of ODI scores between Group A& Group B

### TABLE II

| S.NO | VALUES | RESULTS |
|---|---|---|
| 1 | Mean x1 | 12.3 |
| 2 | Mean x2 | 7.4 |
| 3 | df1 | 9 |
| 4 | df2 | 9 |
| 5 | Ss1 | 297.54 |
| 6 | Ss2 | 88.164 |
| 7 | S2p | 21.428 |
| 8 | N | 10 |
| 9 | Df | 18 |
| 10 | T | 2.378 |

In this Alpha is 0.05, Degrees of freedom is 18, Criticalvalue +2.10 to -2.10; If the't' value is lesser than -2.10 or greater than + 2.10 the hypothesis is rejected. So the hypothesis is rejected and the treatment which is received by Group A is more effective than the treatment received by Group B in this study.

## VISUAL ANALOGUE SCALE (VAS)

## 4.5DEPENDENTSAMPLE‘t’ TEST:

Comparison of Group “A” &”B” pre and post treatment VAS score

### TABLE III

| S.NO | VALUES | GROUP A | GROUP B |
|---|---|---|---|
| 1 | Sum of case wise differences | 50 | 38 |
| 2 | Sum of square case wise differences | 262 | 152 |
| 3 | Mean of case wise differences | 5.0 | 3.8 |
| 4 | Standard deviation | 1.154 | 0.918 |
| 5 | Standard deviation error | 0.364 | 0.290 |
| 6 | Number of patients | 10 | 10 |
| 7 | Df | 9 | 9 |
| 8 | t value | 13.73 | 13.10 |

In this Alphais0.05, Degrees of freedom is 9,Critical value +2.26 to-2.26, If the‘t’ value is lesser than -2.26or greater than 2.26 the hypothesis can be rejected.So the hypothesis is rejected and the test result shows that there is significant pain reductionwith the treatmentin CNSLBP.

## 4.6INDEPENDENTSAMPLE‘t’ TEST

Comparison of VAS score between GROUP A& GROUP B

### TABLE IV

| S.NO | VALUES | RESULTS |
|---|---|---|
| 1 | Mean x1 | 5.0 |
| 2 | Mean x2 | 3.8 |
| 3 | df1 | 9 |
| 4 | df2 | 9 |
| 5 | Ss1 | 11.979 |
| 6 | Ss2 | 7.578 |
| 7 | S2p | 1.08 |
| 8 | N | 10 |
| 9 | Df | 18 |
| 10 | T | 2.586 |

In this Alpha is 0.05, Degrees of freedom is 18, Critical value +2.10 to -2.10;If the ‘t‘value is lesser than -2.10 or greater than 2.10 the hypothesis can be reject. So the hypothesis is rejected and GroupA showed better pain reduction than Group B with the given treatment measures respectively.

# DISCUSSION

# CHAPTER V

# DISCUSSION

In this study the effect of Dry Needling with Stability Exercises versus the effect of Manual Pressure Release with Stability Exercises in the management of Chronic Non- Specific Low Back Pain was studied and the results were compared.

Approximately 84%of people are reported to have an experience of back pain without certain pathology, referred to as Non-Specific Low Back Pain.**Chronic Non -Specific Low Back** Pain (CNSLBP) consists of back pain for more than 3 months, pain between the 12th rib and the top folds gluteal with or without leg pain, and abnormal stability, coordination due to spinal muscle imbalance.

The objective of the study is to compare the effect of the above mentioned two treatment methods in the management of CNSLBP. Unlike the acute LBP, the CLBP lead to Personal, Psychological, Social, and Financial problems in patients with CLBP.

**The Panjabi's theory**, of spinal stability consists of active, passive and neural components,are called as Spinal Stability Model.Stabilization exercises are classified into local or core stabilization exercises and global stabilization exercises. These types of stabilization exercises are aimed at improving the neuromuscular control, endurance, strength of muscles central to maintain dynamic spinal stability.

**Core stabilization exercises** are designed to improve spinal segmental stability and coordination in lumbar muscles as instability of the lumbar spine is the most important cause for chronic LBP though loss of muscular strength and neurologic imbalances are contributes to it.

Low Load core stability exercises and their effect in LBP suggest that there is no single exercise that results in activation of all thecore muscle; A combination of exercises required to result in core stability and strength. Thus the exercises were planned and administered to both groups in this study.

Dry needling with stability exercises Group A would be the most effective treatment approach in patients with CNSLBP with statistical improvement in pain reduction, improvedlumbar flexibility and improvement in function is seen in Group A with 4 weeks of follow up measurements. Manual pressure release with stability exercises would be another effective treatment in the management of CNSLBP.

According to **Rosen Blueth's** law of denervation, denervated tissue develop super sensitivity, in the musculature this manifests as muscle shortening, development of MTrPs. TrPs causes reduced functional capacity of healthy muscle by mechanical inefficiency.

Trigger points can be deactivated through many methods, such as MPR,stretching and cold spray with stretching and needling have reported.
MPR results in temporary further local ischemia during the application of pressure followed by reactive hyperaemia following the pressure release. This additional blood supply relieves hypoxic state and provides ATP for metabolic demands.Pain relief from counter irritant effect or spinal reflex mechanism for the relief of muscle spasm.

**MSI ,VAS,ODI** used as outcome measures in this study to assess the quantity of the lumbar flexibility, pain level, and functional disability pre and post level treatment respectively. In this study MSI as a only clinical measurement showed better improvement after treatments.
When the out-come measures compared within the same group pre and post treatment level,there is considerable improvement in both the groups.

When pre intervention mean was compared with VAS score, it was found that there was statistically significant difference in means of VAS score for pain between groups.

In Group A dry needling with stability exercises focuses on relieving myofascial trigger points especially the deep seated TrPs, and improving the lumbar stability by administering exercises to the core muscles. On contrary Group B given manual pressure release with stability exercises where MPR is not that efficient as DN in treating deep seated TrPs.

The participants demonstrated a poor ODI score and high VAS score before treatment. Since the dry needling and stabilization exercises improved lumbar flexibility, and functional ability,the patients scored higher ODI score after treatment and lesser in the pain scale (VAS).

In ODI the pain intensity and disability had reduced and showed significant improvement within Group A and Group B separately. When compared group A showed better reduction in pain and better improvement in disability than Group B. The pain reduction was measured using VAS. The subjects showed significant pain relief with in Group A and Group B.

According to **the Cochrane collaboration**, DN was stated to be the best method of treatment in ChronicTrPs; and recommended as a significant treatment choice for patients in CLBP with TrPs which supports the result of this study.

The DN technique applied to TrPs, reduces the number and sensitivity of TrPsrelated to pain and reduces peripheral - central sensitization, restoration of joint range of motion, and muscle activation.

Group B who received MPR with stability exercises also showed pain reduction, improvement in lumbar function and disability. As it is not the better treatment option to treat the deep seated trigger points in the muscles that contribute for lumbar stability y and mobility though most research performed supported the efficacy of MPR in treating TrPs.

Depending on the clinical and statistical analysis, this study concluded with the result that **dry needling with stability exercises is the best treatment option in the management ofchronic non- specific low back pain** in reducing pain and improving lumbar flexibility and functional ability.

However the result was based on short term effects with less sample size and the treatment was given with the same physiotherapist ;So to support the conclusion of this study further studies needed with long term follow up,larger sample size ,and administering therapists having better clinical experiences.

# SUMMARY AND CONCLUSION

# CHAPTER VI
# SUMMARY AND CONCLUSION

## SUMMARY

This present study is a comparative study on the effectiveness of Dry Needling with Stability Exercises versus Manual Pressure Release with Stability Exercises in the management of **Chronic Non-Specific Low Back Pain.**

20 Subjects were selected based on the selection criteria and randomized sampling method was used to allocate the subjects into two groups. i.eGroup A and Group B.
Group A was administered with Dry Needling with Stability Exercises and Group B was administered with Manual Pressure Release with Stability Exercises and the pre and post test results are evaluated by using VAS,ODI,MSI as the outcome measures.

## CONCLUSION:

The conclusion of the study is that the Subjects in the Group A who received Dry Needling with Stability Exercises showed more significant pain reduction and functional abilities when compared with the Group B, whoreceivedManualPressure Release with Stability Exercises.

# LIMITATION AND SUGGESTIONS

# CHAPTER VII

## LIMITATIONS AND SUGGESTIONS

### LIMITATIONS

- ✓ Patients included in this study were limited to those referred to a single out Patient department of PPG College of Physiotherapy
- ✓ Subjects were evaluated and treated by a single investigator
- ✓ Study was conducted on a small sample size which might affect the generalization of results.
- ✓ The study was limited to particular age group.

### SUGGESTIONS

- ✓ Long term follow up is needed to evaluate sustained effect of the treatment and to know the reliability and validity of the treatment.
- ✓ Studies should be conducted on both acute and chronic cases.
- ✓ Studies can be conducted on individual of all age group
- ✓ To establish greater efficacy of the treatment this study should be undertaken as randomized study in larger sample size.

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# CHAPTER VIII

## BIBLIOGRAPHY

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# ANNEXURE

# ANNEXURE I

**INFORMED CONSENT FORM**

**TITLE:Effectiveness of Dry Needling with Stability Exercises versus Manual Pressure Release with Stability Exercises for Non-Specific Low Back Pain – A Comparative study**"

**PURPOSE OF THESTUDY**:

I----------have been informed that this study will help clinicians and Therapists to find out the short term effectiveness of dry needling with stability exercises and manual pressure release with stability exercises –A comparative study

**PROCEDURE:**

I----------understand that I will undergo the experiment with Prof .DR .C. Siva Kumar M.P.T(ORTHO),MIAP,PhD.,under the direct supervision of the physiotherapist. I am aware that I have to follow therapist's instruction as has been told to me.

**RISK AND DISCOMFORT**

I---------- understand that there are no potential risks associated with this procedure, and understand that----------will accompany me during this procedure .there are no known hazards associated with this procedure.

**CONFIDENTIALITY:**

I---------- understand that the medical information produced by this study will be confidential. If the data are used for publication in the medical literature or for teaching purpose, no names will be used. And photographs, audio, and video-taps will be used without identity for publication and presentation.

**PHOTOGRAPHY CONSENT:**

----------have explained to me that photography are required in order to illustrate various aspects of the study for the thesis and for the articles and at the presentation or conference. By giving my consent I authorize---------- to use any of the photographs taken of me in printed format, in slides for presentation.

**REQUEST FOR MORE INFORMATION**:

I----------understand that I may ask any question about the study at any times----------,are available to answer my Question.
Copy of this concern form will be given to me keep for my careful reading.

**REFUSAL OR WITHDRAWAL OF PARTICIPATION:**

I----------understand that my participation is voluntary and I may withdraw consent and discontinue participation at any time after he has explained the reasons for doing so.

**INJURY STATEMENT**:

I understand that the diagnostic /treatment procedure,under the guidance of my Therapist, is likely to cause any/no injury.in such case medical attention will be provided,but no compensation will be provided.

I understand my agreement to participation in this studyand I am not waiving any of my legal rights. I confirm that----------.have explained me the purpose of the study, procedure and possible risk that I may experience.

I have read and I have understood this concern to participate as a Subject in this study.

---------- ----------

**SUBJECT** **DATE**

---------- ----------

**WITNESS SIGNATURE** **DATE**

I have explained (----------) the purpose of the research, the procedure required and the possible risks and benefits, to the best of my ability.

---------- ----------

**INVESTIGATOR** **DATE**

**1. JACKULIN SENGOL**

**2. DR.C.SIVA KUMAR**

# ANNEXURE –II

## ORTHOPEADIC ASSESMENT

Name :
Age :
Occupation :
Address :
Chief complaints :

**HISTORY**

Present medical history :
Past medical history :
Drug history :
Surgical history :
Personal history :
Family history :
Socio-economic history :
Psychological history :
Environmental history :
Prior level of activity :
Associated problem :

**Pain history**

Site :
Side :
Onset :
Duration :
Type :

Nature :

Intensity :

Frequency :

Aggravating factors :

Relieving factors :

**VITAL SIGNS**

Temperature :

Blood pressure :

Heart rate :

Respiratory rate :

**OBJECTIVE EXAMINATION**

On observation :

Built :

Posture :

Attitude of limbs :

Swelling :

Bony contours :

Soft tissue contours :

Deformities :

Gait :

Tropical changes :

Respiration :

Type :

Depth :

Pattern :

Mode of ventilations :

External appliances :

Patient's expression :

Patient's attitude :

**ON PALPATION**

Tenderness :

Warmth :

Edema :

Pulse :

**ON EXAMINATION**

Range of Motion :

| Region | Active | | Passive | |
|---|---|---|---|---|
| | Right | Left | Right | Left |
| | | | | |

End feel :

Muscle power :

Deep tendon reflexes :

Sensation :

Limb length discrepancy :

Limb girth measurements

Postural assessment :

Lying :

Sitting :

Standing :

Gait :

Stride length :

Walking base :

Stride period :

Single and double support

Cadence

Stance swing ratio :

Step length :

Gait cycle :

Step period :

Abnormal gait :

Deformity :

Functional assessment :

Special test :

Investigation :

Diagnosis :

Problem :

Aims :

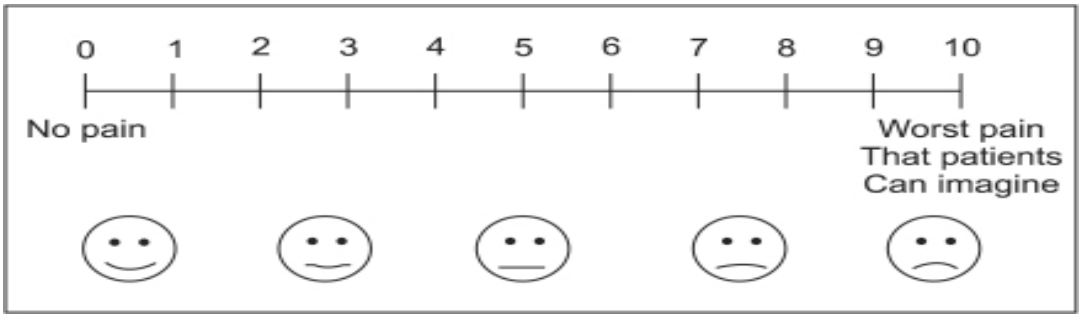
Means :

Home program :

**Signature of the Physiotherapist**

# ANNEXURE III

## VISUAL ANALOGUE SCALE




Visual analogue scale (VAS) is a measurement instrument that tries to measure a charteristic or attitude that is believed to range a continuum of values and cannot easily be measured directly.

Operationally VAS is usually a horizontal line 100 mm in length, anchored by word descriptors at each end. It is determined by measuring in millimetres from left hand end Of the line to the point that patient marks.

# ANNEXURE IV

# OSWESTRY DISABILITY INDEX

**SECTION 1 - PAIN INTENSITY**

- ☐ I can tolerate the pain I have without having to use painkillers.
- ☐ The pain is bad but I manage without taking painkillers.
- ☐ Painkillers give complete relief from pain.
- ☐ Painkillers give moderate relief from pain.
- ☐ Painkillers give very little relief from pain.
- ☐ Painkillers have no effect on the pain and I do not use them.

**SECTION 2 - PERSONAL CARE (washing, dressing etc.)**

- ☐ I can look after myself normally, without causing extra pain.
- ☐ I can look after myself normally, but it causes extra pain.
- ☐ It is painful to look after myself and I am slow and careful.
- ☐ I need some help, but manage most of my personal care.
- ☐ I need help every day in most aspects of self-care.
- ☐ I do not get dressed, wash with difficulty and stay in bed.

**SECTION 3 - LIFTING**

- ☐ I can lift heavy weights without extra pain.
- ☐ I can lift heavy weights, but it gives extra pain.
- ☐ Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned (e.g., on a table).
- ☐ Pain prevents me from lifting heavy weights but I can manage light to medium weights if they are conveniently positioned.
- ☐ I can lift only very light weights.
- ☐ I cannot lift or carry anything at all.

**SECTION 4 - WALKING**

- ☐ Pain does not prevent my walking any distance.
- ☐ Pain prevents me walking more than 1 mile.
- ☐ Pain prevents me walking more than ½ of mile.
- ☐ Pain prevents me walking more than ¼ mile.
- ☐ I can only walk using a stick or crutches.
- ☐ I am in bed most of the time and have to crawl to the toilet.

**SECTION 5 - SITTING**

- ☐ I can sit in any chair as long as I like.
- ☐ I can sit in my favourite chair as long as I like.
- ☐ Pain prevents me sitting more than 1 hour.
- ☐ Pain prevents me from sitting more than ½ an hour.
- ☐ Pain prevents me from sitting more than 10 minutes.
- ☐ Pain prevents me from sitting at all.

**SECTION 6 - STANDING**

- ☐ I can stand as long as I want without extra pain.
- ☐ I can stand as long as I want but it gives me extra pain.
- ☐ Pain prevents me from standing for more than 1 hour.
- ☐ Pain prevents me from standing for more than 30 minutes.
- ☐ Pain prevents me from standing for more than 10 minutes.
- ☐ Pain prevents me from standing at all.

**SECTION 7 - SLEEPING**

- ☐ Pain does not prevent me from sleeping well.
- ☐ I can sleep well only by using tablets.
- ☐ Even when I take tablets, I have less than 6 hours sleep.
- ☐ Even when I take tablets, I have less than 4 hours sleep.
- ☐ Even when I take tablets, I have less than 2 hours sleep.
- ☐ Pain prevents me from sleeping at all.

**SECTION 8 - SEX LIFE (If applicable)**

- ☐ My sex life is normal and causes no extra pain.
- ☐ My sex life is normal but causes some extra pain.
- ☐ My sex life is nearly normal but is very painful.
- ☐ My sex life is severely restricted by pain.
- ☐ My sex life is nearly absent because of pain.
- ☐ Pain prevents any sex life at all.

**SECTION 9 - SOCIAL LIFE**

- ☐ My social life is normal and gives me no extra pain.
- ☐ My social life is normal, but increases the degree of pain.
- ☐ Pain has no significant effect on my social life apart from limiting my more energetic interests, e.g., dancing, etc.
- ☐ Pain has restricted my social life and I do not go out as often.
- ☐ Pain has restricted my social life to my home.
- ☐ I have no social life because of pain.

**SECTION 10 - TRAVELLING**

- ☐ I can travel anywhere without extra pain.
- ☐ I can travel anywhere but it gives extra pain.
- ☐ Pain is bad but I manage journeys over 2 hours.
- ☐ Pain restricts me to journeys of less than 1 hour.
- ☐ Pain restricts me to short necessary journeys under 30 minutes.
- ☐ Pain prevents travel except to the doctor or hospital.

# ANNEXURE V

# OSWESTRY DISABILITY INDEX IN TAMIL

## ஆஸ்வெஸ்டிரி–ன் (Oswestry) இயலாமை குறியீடு கேள்வி தொகுப்பு

இந்த கேள்வித் தொகுப்பு உங்கள் முதுகு மற்றும் அதன் காரணத்தால் உங்கள் காலில் பரவும் வலி எவ்வாறு உங்கள் அன்றாட வாழ்க்கையை பாதிக்கின்றது என்பதை நாம் அறிந்து கொள்ள உதவுகிறது.

தயவு செய்து அனைத்து பகுதிகளுக்கும் பதில் அளிக்கவும். ஒவ்வொரு பகுதியிலும்,இன்றைய உங்கள் நிலையை நெருக்கமாக உணர்த்தும் **ஒரு** கட்டத்தை மட்டும் குறியிடவும்.

**பகுதி – 1 வலியின் கடுமை**

- ☐ எனக்கு தற்போது எந்தவித வலியுமில்லை.
- ☐ எனக்கு தற்போது குறைவான வலியே உள்ளது.
- ☐ எனக்கு தற்போது மிதமான வலியே உள்ளது.
- ☐ எனக்கு தற்போது சிறிது அதிகமான வலி உள்ளது.
- ☐ எனக்கு தற்போது மிகவும் அதிகமான வலி உள்ளது.
- ☐ எனக்கு தற்போது தாங்க முடியாத அளவிற்கு வலி உள்ளது.

**பகுதி – 2 சுய பராமரிப்பு (குளிப்பது, உடை மாற்றி கொள்வது போன்றவை)**

- ☐ என்னுடைய சுய பராமரிப்பு காரியங்களை வலி அதிகரிக்காமல், வழக்கம் போல செய்ய முடிகிறது.
- ☐ வலி இருந்தாலும் என்னுடைய சுய பராமரிப்பு காரியங்களை வழக்கம் போல செய்ய முடிகிறது.
- ☐ வலி அதிகமாக உள்ளதால், என்னுடைய சுய பராமரிப்பு காரியங்களை கவனமாகவும், மெதுவாகவும் செய்கிறேன்.
- ☐ பெரும்பாலான சுய பராமரிப்பு காரியங்களை என்னால் செய்ய முடிந்தாலும், ஒரு சில காரியங்களில் பிறரின் உதவி தேவைப்படுகிறது.
- ☐ பெரும்பாலான சுய பராமரிப்பு காரியங்களில் தினமும் பிறரின் உதவி தேவைப்படுகிறது.
- ☐ என்னால் எந்த சுய பராமரிப்பு காரியங்களையும் செய்ய முடிவதில்லை; படுக்கையிலேயே இருக்கிறேன்.

**பகுதி – 3 பளு தூக்குதல்**

- ☐ என்னால் அதிக எடையுள்ள பொருட்களை வலி அதிகரிக்காமலேயே தூக்க முடிகிறது.
- ☐ என்னால் அதிக எடையுள்ள பொருட்களை தூக்க முடிகிறது; ஆனால் வலி அதிகரிக்கிறது.
- ☐ வலியின் காரணமாக அதிக எடையுள்ள பொருட்களை தரையிலிருந்து தூக்க முடிவதில்லை; ஆனால் சரியான உயரத்திலிருந்து பொருட்களை தூக்க முடிகிறது (எ.கா) மேசை மேலிருந்து.
- ☐ வலியின் காரணமாக அதிக எடையுள்ள பொருட்களை தூக்க முடிவதில்லை; ஆனால் குறைவான மற்றும் மிதமான எடையுள்ள பொருட்களை சரியான உயரத்திலிருந்து தூக்க முடிகிறது.
- ☐ என்னால் மிகவும் குறைவான எடையுள்ள பொருட்களை மட்டுமே தூக்க முடிகிறது.
- ☐ என்னால் எந்த பொருளையும் தூக்கவோ, தூக்கி கொண்டு நடக்கவோ முடிவதில்லை.

பகுதி – 4 நடந்து செல்லுதல்

- ☐ எவ்வளவு தூரம் நடப்பதற்கும் வலி தடையாக இருப்பதில்லை.
- ☐ வலியின் காரணமாக 1 கிலோ மீட்டருக்கு மேல் என்னால் நடக்கமுடிவதில்லை.
- ☐ வலியின் காரணமாக 250 மீட்டருக்கு மேல் என்னால் நடக்கமுடிவதில்லை.
- ☐ வலியின் காரணமாக 100 மீட்டருக்கு மேல் என்னால் நடக்கமுடிவதில்லை.
- ☐ ஊன்றுகோல் அல்லது கை தடியின் உதவியோடுதான் என்னால் நடக்க முடிகிறது.
- ☐ நான் அதிக நேரம் படுக்கையிலேயே படுத்திருக்கிறேன்; கழிப்பறைக்கு தவழ்ந்து செல்கிறேன்.

பகுதி – 5 உட்காருதல்

- ☐ எந்த வகையான இருக்கையிலும் எவ்வளவு நேரம் வேண்டுமானாலும் என்னால் உட்கார முடிகிறது.
- ☐ எனக்கு மிகவும் வாட்டமான இருக்கையில், எவ்வளவு நேரம் வேண்டுமானாலும் என்னால் உட்கார முடிகிறது.
- ☐ வலியின் காரணமாக 1 மணி நேரத்திற்கு மேல் என்னால் உட்கார முடிவதில்லை.
- ☐ வலியின் காரணமாக ½ மணி நேரத்திற்கு மேல் என்னால் உட்கார முடிவதில்லை.
- ☐ வலியின் காரணமாக 10 நிமிடத்திற்கு மேல் என்னால் உட்கார முடிவதில்லை.
- ☐ வலியின் காரணமாக என்னால் உட்காரவே முடிவதில்லை.

பகுதி – 6 நிற்பது

- ☐ என்னால் வலி அதிகரிக்காமல் எவ்வளவு நேரம் வேண்டுமானலும் நிற்க முடிகிறது.
- ☐ என்னால் எவ்வளவு நேரம் வேண்டுமானாலும் நிற்க முடியும் ; ஆனால் வலி அதிகரிக்கிறது.
- ☐ வலியின் காரணமாக 1 மணி நேரத்திற்கு மேல் என்னால் நிற்கமுடிவதில்லை.
- ☐ வலியின் காரணமாக ½ மணி நேரத்திற்கு மேல் என்னால் நிற்கமுடிவதில்லை.
- ☐ வலியின் காரணமாக 10 நிமிடத்திற்கு மேல் என்னால் நிற்கமுடிவதில்லை.
- ☐ வலியின் காரணமாக என்னால் நிற்கவே முடிவதில்லை.

பகுதி – 7 தூங்குதல்

- ☐ வலியின் காரணமாக என் தூக்கம் எப்போதுமே தடைபடுவதில்லை.
- ☐ வலியின் காரணமாக என் தூக்கம் எப்போதாவது தடைபடுகிறது.
- ☐ வலியின் காரணமாக என்னால் 6 மணி நேரத்திற்கும் குறைவாகவே தூங்க முடிகிறது.
- ☐ வலியின் காரணமாக என்னால் 4 மணி நேரத்திற்கும் குறைவாகவே தூங்க முடிகிறது.
- ☐ வலியின் காரணமாக என்னால் 2 மணி நேரத்திற்கும் குறைவாகவே தூங்க முடிகிறது.
- ☐ வலியின் காரணமாக என்னால் தூங்கவே முடிவதில்லை.

பகுதி – 8 பாலியல் வாழ்க்கை / தாம்பத்ய உறவு (பொருந்துமானால்)

- ☐ எனது பாலியல் வாழ்க்கை இயல்பாக உள்ளது; வலி அதிகரிப்பதில்லை.
- ☐ எனது பாலியல் வாழ்க்கை இயல்பாக உள்ளது; ஆனால் சற்று வலி அதிகரிக்கிறது.
- ☐ எனது பாலியல் வாழ்க்கை ஏறக்குறைய இயல்பாக உள்ளது; ஆனால் வலி அதிகமாக உள்ளது.
- ☐ எனது பாலியல் வாழ்க்கை வலியின் காரணமாக கடுமையாக தடைபடுகிறது.
- ☐ எனது பாலியல் வாழ்க்கை வலியின் காரணமாக ஏறக்குறைய நிகழ்வதே இல்லை.
- ☐ எனது பாலியல் வாழ்க்கை வலியின் காரணமாக முற்றிலுமாக தடைபடுகிறது.

பகுதி – 9 சமூக வாழ்க்கை (விளையாட்டு, பொழுதுபோக்கு, சுகம் மற்றும் துக்க நிகழ்ச்சிகளில் ஈடுபாடு)

- ☐ எனது சமூக வாழ்வு இயல்பாக உள்ளது; வலி அதிகரிப்பதில்லை.
- ☐ வலி அதிகமாக இருந்தாலும் எனது சமூக வாழ்வு இயல்பாக உள்ளது.
- ☐ வலி எனது சமூக வாழ்வில் குறிப்பிடதக்க விளைவுகள் ஒன்றையும் ஏற்படுத்தவில்லை என்றாலும் விளையாட்டு போன்ற கறுகுறுப்பான செயல்களில் ஈடுபடுவதற்கு தடையாக உள்ளது.
- ☐ எனது சமூக வாழ்வை வலி தடை செய்கிறது; என்னால் அதிகமாக வெளியே செல்ல முடிவதில்லை.
- ☐ வலியின் காரணமாக எனது சமூக வாழ்வு வீட்டிற்குள்ளேயே முடங்கி உள்ளது.
- ☐ வலியின் காரணமாக எனது சமூக வாழ்வு முற்றிலுமாக தடைபட்டு உள்ளது .

பகுதி – 10 பயணம் செய்தல்

- ☐ வலியே வராமல் எங்கு வேண்டுமானாலும் என்னால் பயணம் செய்ய முடிகிறது.
- ☐ எங்கு வேண்டுமானாலும் என்னால் பயணம் செய்ய முடிகிறது; ஆனால் வலி அதிகரிக்கிறது.
- ☐ வலியின் காரணமாக 2 மணி நேரத்திற்கு மேலாக என்னால் பயணம் செய்ய முடிவதில்லை.
- ☐ வலியின் காரணமாக 1 மணி நேரத்திற்கும் குறைவாகவே என்னால் பயணம் செய்ய முடிகிறது.
- ☐ வலியின் காரணமாக 30 நிமிடத்திற்கு குறைவான மற்றும் தேவையான பயணங்களையே செய்யமுடிகிறது.
- ☐ வலியின் காரணமாக மருத்துவ சிகிச்சைக்கு செல்வதை தவிர வேறு எங்கும் பயணம் செய்ய முடிவதில்லை.

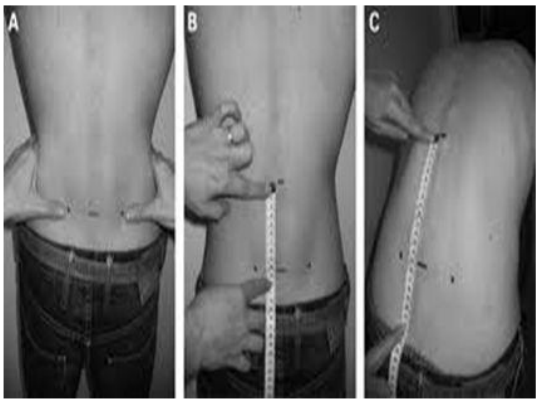
**ANNEXURE VI**

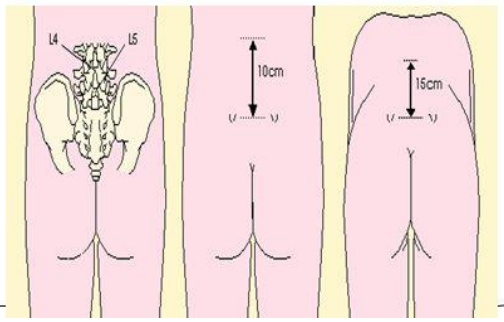
**MODIFIED SCHOBER INDEX**

## Lumbar flexion (modified Schober)

- With the patient standing upright, place a mark at the lumbosacral junction (at the level of the dimples of Venus on both sides). Further marks are placed 5 cm below and 10 cm above. Measure the distraction of these two marks when the patient bends forward as far as possible, keeping the knees straight

• The distance less than 5 cm is abnormal

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